

WHAT IS CLAIMED IS:

Sub C17

1. A brake controller system comprising:
 - brakes located on a towed vehicle;
 - a brake activator for applying force to said brakes;
 - 5 a brake control unit in communication with said brake activator, said brake control unit having a CPU;
 - a battery in electrical communication with said brake control unit for supplying power to said brake control unit;
 - 10 voltage regulation circuitry in electrical communication with said brake control unit;
 - said CPU in electrical communication with a bus that is in communication with at least said brake activator; and
 - 15 a voltage booster in electrical communication with said battery and with said brake activator.
- Sub C17* 2. The brake controller system according to claim 1 wherein said brakes are electric brakes.
- 15 3. The brake controller system according to claim 1 further comprising:
 - a towing vehicle having a towing vehicle brake system for operating towing vehicle brakes, said towing vehicle brake system having a master cylinder.
- Sub C17* 4. The brake controller system according to claim 1 wherein:
 - 20 said brake activator is comprised of magnets; and
 - a current sensor for maintaining constant amperage to the towed vehicle brakes.

Sub C1> 5. The brake controller system according to claim 4 wherein:
said CPU adjusts a signal for brake activation, based at least partially on data from said
current sensor.

5 6. The brake controller system according to claim 3 further comprising:
a pressure sensor in said towing vehicle master cylinder for measuring the pressure of
brake fluid within said towing vehicle brake system.

Sub C1> 7. The brake controller system according to claim 1 wherein:
wherein said brake control unit is located within a towing vehicle.

10 *Sub C1>* 8. The brake controller system according to claim 1 wherein:
said bus communicates said CPU with brake lights on said towing vehicle.

9. The brake controller system according to claim 1 wherein:
said bus communicates said CPU with a pressure sensor positioned proximate a master
cylinder of said towed vehicle.

15 *Sub C1>* 10. The brake controller system according to claim 1 wherein:
said bus is a brake wire that receives multiplexed signals.

Sub B2> 11. The brake controller system according to claim 1 further comprising:
a display on a front face of said brake controller unit and in communication with said
CPU for use as a visual indicator to an operator.

B2> 12. The brake controller system according to claim 1 further comprising:

a control panel on said brake controller unit comprising an adjust selection display down button, and adjust selection display up button, an enter selection displayed button and a scroll menu button.

5 Sub 13. The brake controller system according to claim 1 further comprising:

B3 a manual thumb brake switch on brake controller unit for manually operating said brakes.

10 14. A method for operating a brake controller system comprising the steps of:

signaling a voltage booster to supply additional voltage above a towing vehicle standard voltage; and

actuating the towed vehicle brakes.

15 15. The method for operating a brake controller system comprising the steps of:

sensing brake fluid pressure within a towing vehicle brake system with a pressure sensor;

sensing current in an electric brake system;

calculating with a brake controller unit the appropriate amount of brake force to be applied by said brake activator;

determining whether a voltage booster is required to supply additional voltage to said towing vehicle brake system;

20 applying an appropriate amount of brake force with an appropriate amount of voltage as directed by said brake controller unit.

16. The method for operating a brake controller system according to claim 15 further comprising the steps of:

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signaling brake lights and a brake activator with said brake controller unit over a brake line by multiplexing signals over said brake line.

17. The method for operating a brake controller system according to claim 15 further comprising the steps of:

5 actuating towed vehicle brakes without actuating towing vehicle brakes by use of a manual thumb brake switch;

generating a signal from said brake controller unit that is based upon and directly proportional to a linear position of the manual thumb brake switch; and

activating said brake activator with said signal.

Sub Cl 18. The method for operating a brake controller system according to claim 15 further comprising the steps of:

storing data within a CPU of said brake controller system;

displaying at least a portion of said data with an alphanumeric display as a visual indicator to the vehicle operator during operation of the brake controller;

15 wherein said data is selected from a group comprising: Brake Gain; Time; Date; Last Maximum Brake; Last Maximum Stroke; Last Test: Maximum Brake; Last Test: Maximum Stroke; Truck Control: Serial Number; Truck Control: Date Manufactured; Truck Control; Born on Date; Trailer Control: Serial Number; Trailer Control: Date Manufactured; Trailer Control: Born on Date; Run Diagnostic: Test Brakes.

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